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WATER POLLUTION SURVEY

of the

VILLAGE OF PAISLEY

COUNTY OF BRUCE

1971

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R E P O R T

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WATER POLLUTION SURVEY

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DISTRICT ENGINEERS BRANCH

DIVISION OF SANITARY ENGINEERING

DATE OF SAMPLING, OCTOBER 13, 1971.

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WATER POLLUTION SURVEY

VILLAGE OF PAISLEY

INTRODUCTION

The purpose of the survey was to locate and record significant sources of water pollution within the Village of Paisley. Surveys of this nature are conducted throughout the Province of Ontario by the Sanitary Engineering Division of the Water Resources Commission and form a basis for evaluating any existing or potential sources of pollution.

Recommendations are subsequently made pertaining to water pollution abatement.

The appendices to this report include a tabulation of the sample results, an interpretation of the laboratory test and a map of the area showing the location of sampling points.

LOCATION

The Village of Paisley is located at the intersection of County Roads 3 and 11 in the south central portion of Bruce County. The Saugeen River flows through the Village and is intercepted by the smaller Teeswater River.

POPULATION

1970 population, as obtained from the 1971 Municipal Directory, is listed as 749 persons.an increase of 17 persons over the 1969 population.

SOIL CONDITIONS

The types of soil in the Village area vary from a very porous sandy loam to impermeable heavy clay. The great variation of permeabilities make the use of sub-surface disposal system impractical in many cases.

RECREATIONAL FACILITIES

The two major rivers, the Saugeen and the Teeswater, are important conservation streams. They are stocked with various species of trout and provide excellent fishing.

MUNICIPAL SERVICES

WATER WORKS

The Village of Paisley is served by a municipally owned and operated water works system. Raw water is drawn from the Teeswater about 1/4 mile from the confluence with the Saugeen River. Treatment consists of filtration and chlorination.

SEWAGE

There are no municipal facilities for the collection and treatment of domestic or industrial wastes generated within the Village at this time. A project for the provision of a communial sewage and treatment system is under development. The disposal of sanitary wastes was left to the individual property owner and in most cases this consisted of a septic tank system.

STORM WATER

The municipality has installed over the years a storm water collection system on most of the major streets. All the storm sewers outlets discharge directly to the Teeswater or Saugeen Rivers.

PREVIOUS STUDIES

The Sanitary Engineering Division of the Commission has carried out three previous pollution surveys of the Village in 1959, 1960 and 1965. All reports indicated that domestic sanitary wastes were gaining access to the storm sewers and hence to the major watercourses.

In 1968 the consulting engineering firm of Gamsby and Mannerow Ltd. were engaged by the OWRC to carry out a series of design studies to determine the most efficient and economical method of sewage disposal and collection for the Village.

Peto Associates Ltd. Consulting Soil Engineers were hired by Gamsby and Mannerow in 1968 to conduct a detailed study of the soil condition within the Village and the effects such conditions would have on the installation of the collector system.

SAMPLE RESULTS

A total of 30 samples were collected from scattered locations throughout the Village.

The chemical and bacteriological sample results of this survey and the sample locations may be found in the Appendices II and III respectively. The presence of fecal coliform bacteria, ABS, high BOD and suspended solids levels indicate the presence of domestic sanitary sewage.

DISCUSSIONS OF SAMPLES

RIVER SAMPLES

Samples of the Saugeen River and the Teeswater River were collected at points R 14; R 16 and R 7. All bacteria samples exhibited fecal and coliform organisms. The chemical analyses indicated low concentrations of BOD, ABS. suspended and dissolved solids.

STORM SEWER SAMPLES

A total of ten manholes were opened and sampled throughout Village. All samples contained various concentrations of fecal coliform and coliform bacteria, ABS, BOD, dissolved and suspended solids.

STORM SEWER SAMPLES (cont'd)

Sample point 0-6 represents the main storm sewer outfall at the south end of the Queen Street Bridge, the results of the analysis indicated high levels of bacteria, BOD, ABS, suspended and dissolved solids.

Two private outfalls 0-3 and 0-8 were noted and sampled. Sample point 0-3 contain high fecal and coliform bacteria, no chemical samples were taken at that point. Sample 0-8 originating from a dairy processing industry in the west end of the Village was high in bacteria, BOD, suspended and dissolved solids and ABS.

An open ditch was sampled at point D-2 on Inkerman Street. The sample results indicated that the contents of the ditch were high in bacteria counts, BOD, ABS, suspended and dissolved solids.

SUMMARY

On October the 13th, 1971, a water pollution survey of the Village of Paisley was carried out by OWRC field staff.

The quality of the water of the Teeswater and Saugeen Rivers was within the limits established by the Commission for surface water.

All the storm sewers sampled contained fecal coliform bacteria and chemical pollutants such as ABS. The two private outfalls that were sampled indicated that sanitary or industrial wastes were being discharged directly or with little treatment to the Saugeen or Teeswater Rivers. The open ditch lying to the East of Queen Street and north of Alma Street contained high concentrations of domestic sanitary wastes.

SUMMARY (cont'd)

This survey confirms the finding of previous studies that the domestic sanitary wastes generated with the Village are gaining access to major surface waters in the area.

Corrective measures must be undertaken either on an individual basis, by disconnecting sewer connections and building adequate subsurface disposal systems, or by construction of a municipal sewage collection and treatment facilities.

The impermeability of the soils in some areas and the built-up commercial downtown's section tends to rule out individual subsurface corrective measures.

CONCLUSION

The present methods of treating the sanitary wastes that are generated within the Village of Paisley are totally inadequate.

CONCLUSION (cont'd)

The domestic sanitary wastes generated by the Village are being transported to the Saugeen River and smaller Teeswater River by the municipal storm sewer system, open ditches and private outfalls.

RECOMMENDATIONS

It is recommended that the Village of Paisley proceed and complete the proposed project that would provide the Village with a municipal sewage collection and treatment system to eliminate the pollution of the Saugeen and Teeswater Rivers by domestic sanitary wastes generated by the Village.

Prepared by: K D Anderson

K. D. Anderson
District Engineers Branch
Division of Sanitary Engineering.

APPENDIX I

INTERPRETATION AND SIGNIFICANCE OF ANALYSES RESULTS

For convenience in the interpretation of laboratory analyses results, the Ontario Water Resources Commission water quality objectives for surface water drains and watercourses are listed as follows:

Bacteriological Examination

The membrane filter (MF) technique is employed at OWRC Laboratories to obtain a direct enumeration of coliform organisms and is reported per 100 millilitres (ml) of the sample.

The presence of coliforms may indicate pollution from both fecal and non-fecal sources while fecal organisms indicate pollution of intestinal origin only.

Sanitary Chemical Analyses

Biochemical Oxygen Demand (BOD)

The BOD of sewage or polluted waters is the oxygen required during stabilization of the decomposible organic material by aerobic biochemical action. A five-day BOD determination with incubation at 20 degrees Centrigrade is reported.

A high BOD is indicative of organic or chemical pollution. A desirable upper limit in surface water is four (4)* parts per million (ppm) while the objective maximum in waste discharges to a watercourse is 15 ppm.*

Solids

The value for total solids, expressed in parts per million (ppm), is the sum of the values for the suspended and dissolved matter in water. The concentration of suspended solids which indicates the measure of undissolved solids of organic or inorganic nature is generally the most significant of the solids analyses in regard to surface water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, deposition in streams, and injury to the habit of fish. The OWRC's objective for discharge is a suspended solids concentration of not greater than 15 ppm.*

* See next page.

Alkyl Benzene Sulfonate (ABS) -(Anionic Surfactant)

The surfactant is a synthetic organic chemical which is used as a principal ingredient of modern household detergents. The popular use of synthetic detergents for general cleaning purposes has resulted in the incidence of residual ABS in waste discharges. Therefore, the presence of detergents in water samples is usually an indication of pollution from domestic sources.

* Under very restrictive environmental conditions such as low stream flow or intensive water use, these quality criteria and effluent requirements may have to be up-graded or become more restrictive.

APPENDIX II

PAISLEY POLLUTION SURVEY OCTOBER 13, 1971

Sample No.	Location	Bacteria fecal per 100 ml	Bacteria coliform per 100 ml	BOD 5-Day ppm	SOLIDS Total ppm	SOLIDS Susp. ppm	SOLIDS Diss. ppm	ABS ppm
S-24.15	M-1 Manhole corner of James & Arnolds Sts.	100	2,100	8.5	370	65	305	1.2
S-23.55	D-2 Open Ditch - George St.	15,000	6,200,000	34	650	20	630	2.7
S-23.25	G-3 Private OUtfall - Water St.	80,000	6,100,000	-	-	-	-	-
S-23.55	M-4 Manhole Albert & Inkerman St.	1,000	290,000	-	-	-	-	-
S-24.15	M-5 Manhole Albert & Arnold St.	1,000	8,000,000	-	-	-	-	-
S-23.25	O-6 Main Outfall Queen St.	210,000	22,000,000	34	440	110	330	0.7
S-23.70	R-7 River Sample Teeswater	10	480	0.6	230	5	225	0.1
S-23.85	O-8 Private Outfall Discharging to Teeswater	1,000	30,000	65	470	50	420	0.6
S-23.40	M-9 Manhole Victoria & Mill Sts.	160,000	10,900,000	90	550	120	430	5.0
S-23.40	M-10 Mahnole Inkerman St. between Albert & Queen St.	20,000	31,000,000	36	1,000	760	240	2.2
S-23.40	M-11 Manhole North Side of Inkerman St.	34,000	9,000,000	65	2,040	2,040	520	2.4
S-23.25	M-12 Manhole North Side of Queen St. Bridge	7,000	340,000	1.6	620	240	380	0.1
S-23.25	M-13 Manhole Queen St. in front of Medical Co-op Bldg.	1,000	80,000	16	400	230	170	1.0
S-23.10	R-14 River Sample Saugeen River	10	870	0.6	370	5	365	0.1
S-23.10	M-15 Manhole Water St.	780	210,000	-	-	-	-	-
S-23.10	R-16 River Sample Saugeen River	160	1,210	0.6	660	5	655	0.1
S-23.10	M-17 Manhole Church St. West of Queen	11,000	870,000	32	700	270	430	1.6

PAISLEY

NORTH STREET
CAMBRIDGE STREET
WILLOW CREEK
SAUGEEN RIVER
TEESWATER RIVER
C.N.R.
ROSS ST.
GEORGE ST.
WATER ST.
FOUR WAY MILK PROD
CHURCH ST.
DE LACY EVANS ST.
DUKE ST.
ROWE ST.
PAISLEY FEED MILL
GOLDIE ST.
INKERMAN ST.
ALMA ST.
BALAKLAVA ST.
ARNAUD ST.
CANROBERT ST.
REGENT ST.
VICTORIA ST.
QUEEN ST.
ALBERT ST.
GEORGE ST.
JAMES ST.
NELSON ST.
DUNDAS ST.
(DRY)
OLD MUNICIPAL WELL

ST-22·65 M
S-23·10 M-17
S-23·10 M-15
S-23·25 M-13
S-23·25 M-12
S-23·25 O-6
S-23·25 O-3
S-23·40 M-9
S-23·40 M-10
S-23·40 M-11
S-23·55 M-4
S-23·85 O-8
S-23·55 D-2
S-24·15 M-1
S-24·15 M-5
R16 S-23·10
R14 S-23·10
R-7 S-23·70

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LEGEND

R-1 S-2221 — STREAM SAMPLING POINT SHOWING MILEAGE.

S-22-23 D-1 — OUTFALL SHOWING STREAM AND MILEAGE.
— TYPE OF OUTFALL
D - DITCH
M - MANHOLE / CATCHBASIN
O - OUTFALL

• — MANHOLE OR CATCHBASIN

← — OUTFALL

ONTARIO WATER RESOURCES COMMISSION

VILLAGE OF PAISLEY

Water POLLUTION SURVEY

1971

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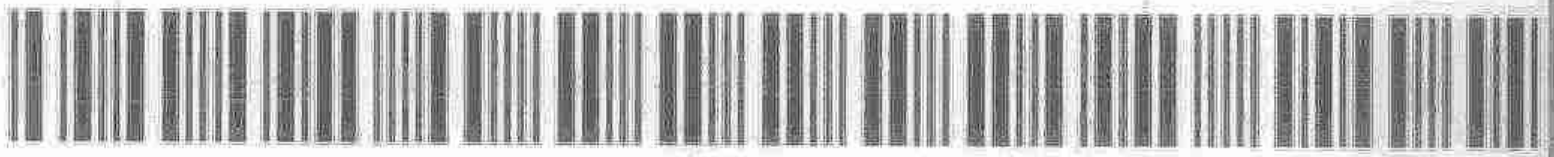
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